13 Oesophageal cancer

13.1 Summary

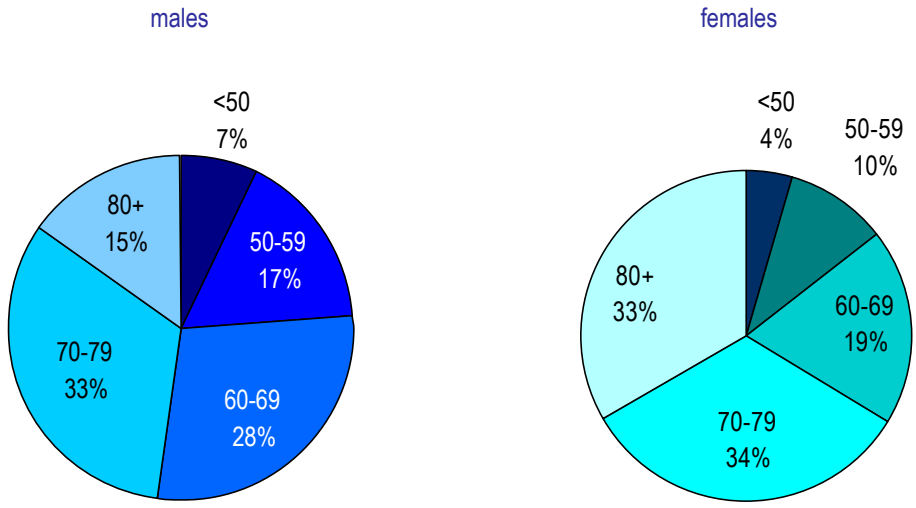
Cancer of the oesophagus ranks as the 16th most common cancer in Ireland, accounting for 2.3% of all malignant neoplasms - 2.7% in men and 1.8% in women, when non-melanoma skin cancer is excluded (table 13.1). Each year approximately 186 men and 120 women are diagnosed with a tumour in the oesophagus. During the years 1994 to 2003, incidence rates remained stable in women and decreased slightly in men.

Table 13.1 Summary information for oesophageal cancer in Ireland, 1994-2003

	females	males
% of all new cancer cases	1.3%	1.9%
% of all new cancer cases excluding non-melanoma skin cancer	1.8%	2.7%
Average number of new cases per year	120	186
Average number of deaths per year	116	192
Age standardised incidence rate per 100,000 (European standard population)	5.7	11.6
Estimated annual percentage change in rate 1994-2003	-1.4%	-0.5%

The age distribution of oesophageal cancer differs between men and women (figure 13.1). More than half of all male cases, but only one-third of female cases, are aged under 70 at diagnosis, while 33% of female cases are aged 80 or over.

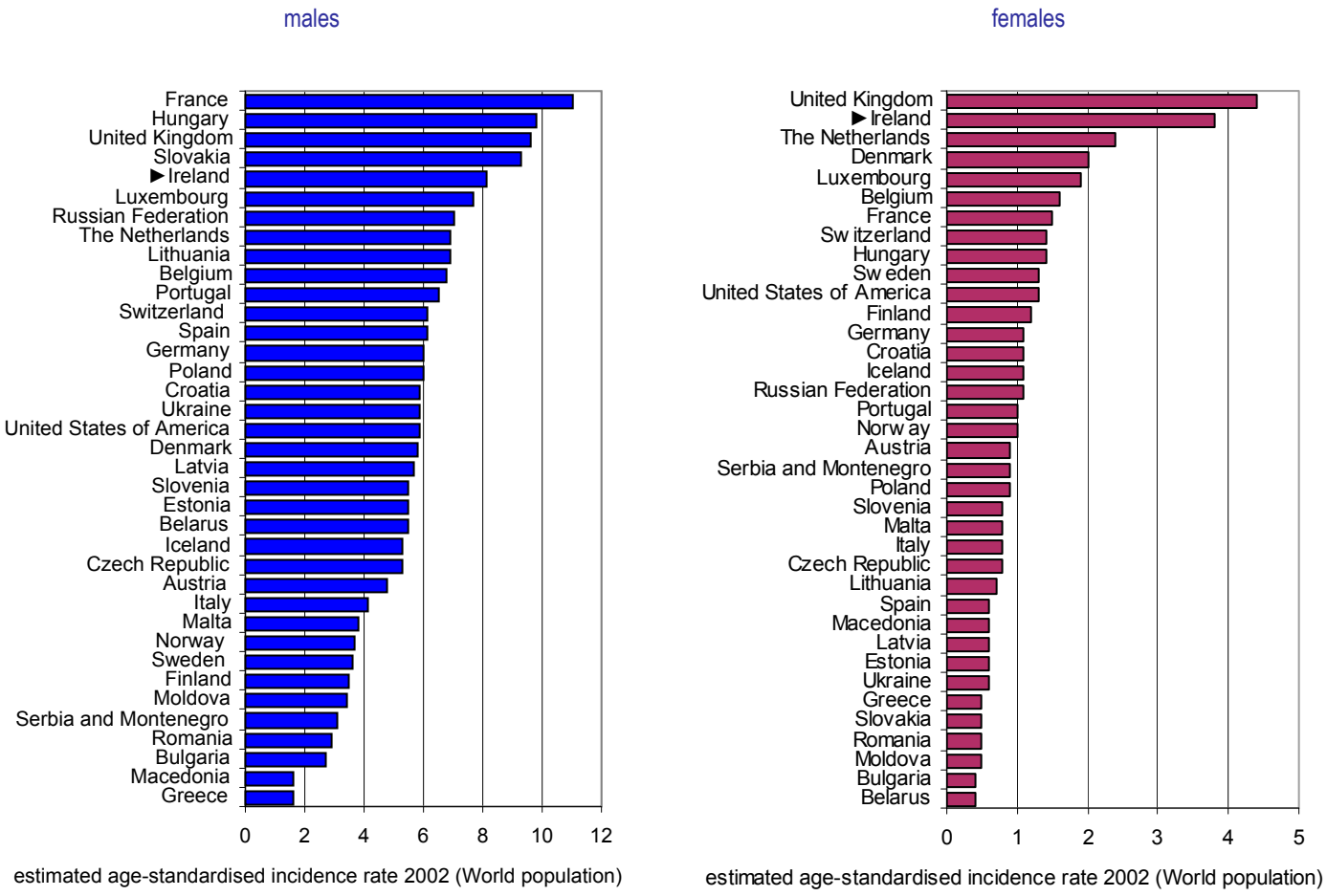
Figure 13.1 Age distribution of oesophageal cancer cases, 1994-2003, males and females



13.2 International variations in incidence

Oesophageal cancer incidence in both men and women in Ireland is among the highest in Europe (figure 13.2). The rate in Ireland is more than twice that for women in the USA and exceeds by 30% the rate in the USA in men. However, incidence rates in Ireland were lower than in the UK, which had the third highest rate in Europe in men and the highest in women.

Figure 13.2 Estimated incidence rate per 100,000 in 2002 for Europe and USA: oesophageal cancer



Source: GLOBOCAN 2002 (Ferlay et al, 2004)

13.3 Risk factors

Table 13.2 Risk factors for oesophageal cancer, by strength of evidence

	Increases risk	Decreases risk
Convincing or probable	Tobacco smoking and smokeless tobacco use[1,2]	Non-starchy vegetables[3,8]
	Alcohol[3,4]	Fruit[3,8]
	Body fatness/higher body mass index[3]	Foods containing beta-carotene[3,9]
	Gastro-oesophageal reflux disease[5]	Foods containing vitamin C[3,10]
	Low socio-economic status[6]	*Helicobacter pylori* infection[11,12]
		Aspirin and other non-steroidal anti-inflammatory drugs[13,14]
Possible	Red meat[3]	
	Processed meat[3]	
	High temperature drinks[3]	
	Infection with human papilloma viruses (HPV)[7]	

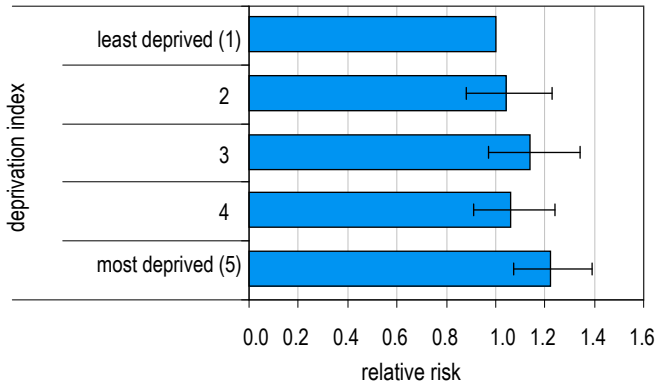
[1] International Agency for Research on Cancer, 2004b; [2] Boffetta et al, 2008a; [3] World Cancer Research Fund / American Institute for Cancer Research, 2007; [4] International Agency for Research on Cancer, in press; [5] Pera et al, 2005; [6] Faggiano et al, 1997; [7] International Agency for Research on Cancer, 2007a; [8] International Agency for Research on Cancer, 2003; [9] beta-carotene is found in yellow, orange and green fruits and green leafy vegetables; [10] vitamin C is found in fruit, vegetables and tubers; [11] Islami and Kamangar, 2008; [12] Rokkas et al, 2007; [13] Bosetti et al, 2006; [14] Abnet et al, 2009

There are two main types of oesophageal cancer - squamous cell carcinoma and adenocarcinoma. Some risk factors are shared by both types, while others are involved in one type only. It is firmly established that tobacco smoking causes both squamous cell carcinoma and adenocarcinoma of the oesophagus. Smokers have at least a two-fold higher risk than non-smokers and risk increases with number of cigarettes smoked daily and duration of smoking. Use of smokeless tobacco products (e.g. snuff, chewing tobacco) is also associated with increased disease risk. Alcohol is also causally related to oesophageal cancer.

Obesity and overweight are positively associated with adenocarcinoma and risk increases in a dose-response fashion with increasing body mass index. In contrast, body fatness does not appear to affect risk of squamous cell carcinoma. Similarly, a past history of gastro-oesophageal reflux disease has been related to increased risk of adenocarcinoma, while infection with the *Helicobacter pylori* (*H pylori*) bacterium is associated with a reduced risk of adenocarcinoma - neither of these is associated with squamous cell carcinoma. Most, but not all, studies have found a reduced risk of adenocarcinoma in individuals who regularly use aspirin or other non-steroidal anti-inflammatory drugs. On the other hand, it is possible that HPV infection may play a role in squamous cell carcinoma, but the evidence is not entirely consistent. Various aspects of diet have been associated with oesophageal cancer risk. Higher intakes of fruit and vegetables, particularly those containing beta-carotene (yellow, orange and green fruits and green leafy vegetables) or vitamin C, probably reduce risk. Higher intakes of red or processed meat may increase risk, but the evidence is less consistent than for fruit and vegetables. Risk of oesophageal cancer is higher in those of low socio-economic status, probably reflecting variations by social class in exposure to tobacco and other lifestyle risk factors.

13.4 Electoral district characteristics and cancer incidence

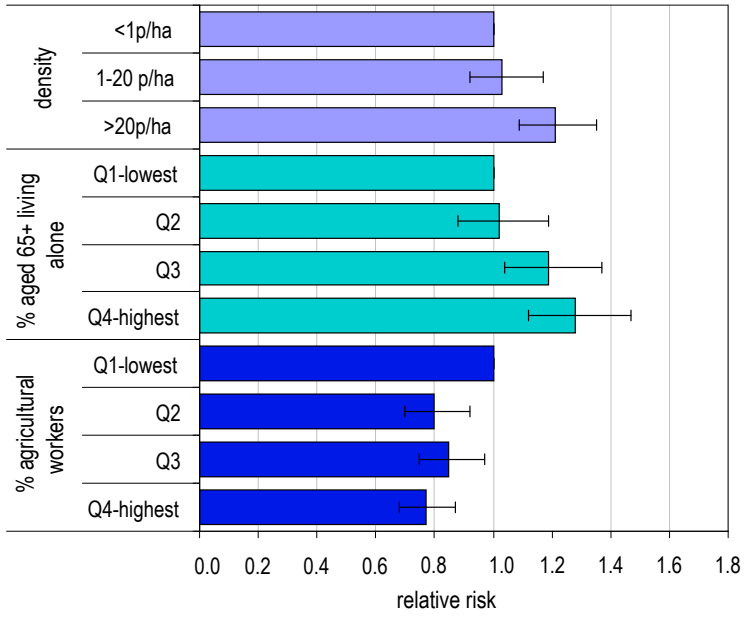
Figure 13.3 Adjusted relative risks of oesophageal cancer by deprivation index: males



Adjusted for population density

Oesophageal cancer incidence in men was significantly associated with the deprivation index of the area of residence (figure 13.3). The risk in the most deprived areas was more than 20% higher than that in the least deprived areas (RR=1.22, 95% CI 1.07-1.39).

Figure 13.4 Adjusted relative risks of oesophageal cancer by area characteristics: males



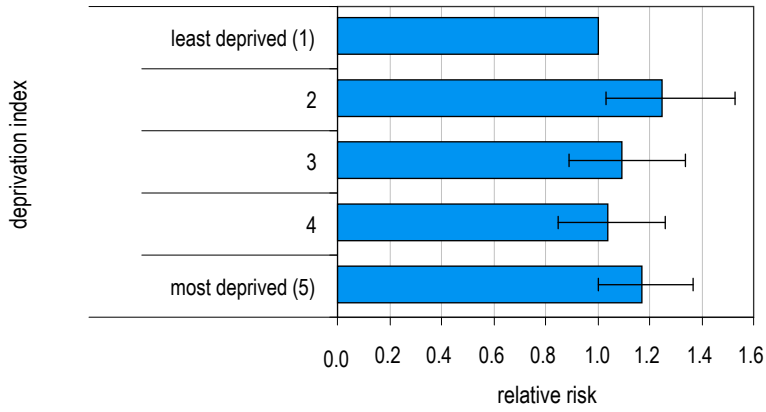
All variables mutually adjusted except % of agricultural workers (not adjusted for density)

Population density was significantly associated with incidence of oesophageal cancer in men (figure 13.4). Men living in urban areas (>20 p/ha) were significantly more likely to be diagnosed with oesophageal cancer (RR=1.21, 95% CI 1.09-1.35).

In contrast, areas with the highest proportion of agricultural workers had the lowest risk of oesophageal cancer.

The only other area characteristic which was significantly associated with oesophageal cancer risk was the proportion of those aged over 65 living alone. As for other cancers, risk of oesophageal cancer in men increased with an increase in the proportion of elderly living alone.

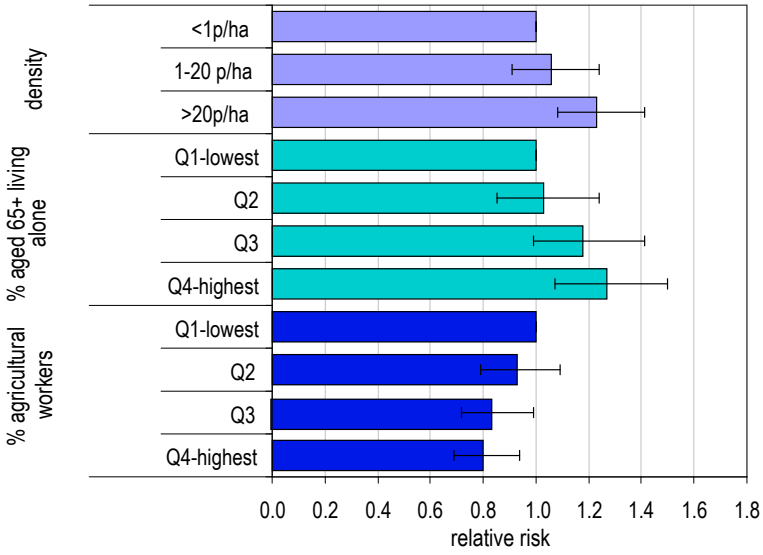
Figure 13.5 Adjusted relative risks of oesophageal cancer by deprivation index: females



Adjusted for population density

As for men, the risk of oesophageal cancer in women was lowest for those residents in the least deprived areas (figure 13.5). The association in women was less strong than in men; the risk estimate for the most, compared to the least, deprived areas was 1.17 (95% CI 1.00-1.37).

Figure 13.6 Adjusted relative risks of oesophageal cancer by area characteristics: females



all variables mutually adjusted except % of agricultural workers (not adjusted for density)

Risk of oesophageal cancer in women increased with increasing population density (figure 13.6). The risk was 23% higher for women in the most, compared to the least, populated areas (RR=1.23, 95% CI 1.08-1.41).

Risk decreased with an increasing proportion of agricultural workers in the area. Other than this, as for men, the only factor significantly associated with oesophageal cancer in women was the proportion of persons aged 65 and older; areas with a higher proportion had a higher risk.

Socio-economic variation

For both men and women, there was a significant association between both urban residence and deprivation and higher oesophageal cancer risk, although the effect of deprivation was stronger in men than women and there was not a clear trend in either sex. Apart from these, there were no significant associations with any of the other socio-demographic variables studied. As oesophageal cancer is two separate diseases - squamous cell carcinoma and adenocarcinoma - with different risk factors, the lack of strong association with known risk factors is unsurprising. The association with the proportion of people over 65 living alone exists for almost all cancers and is difficult to explain.

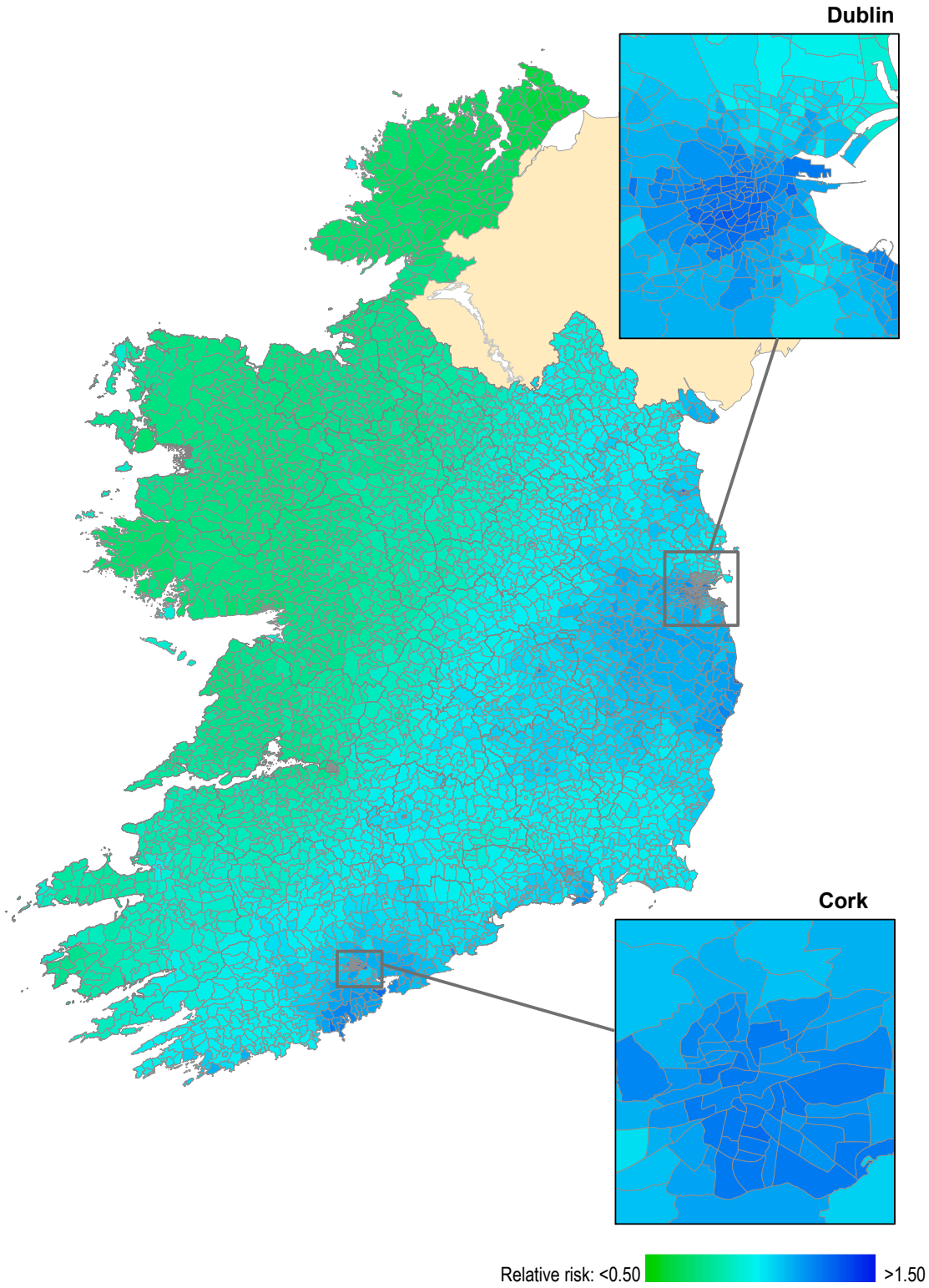
13.5 Mapping and geographical variation

Geographical variation

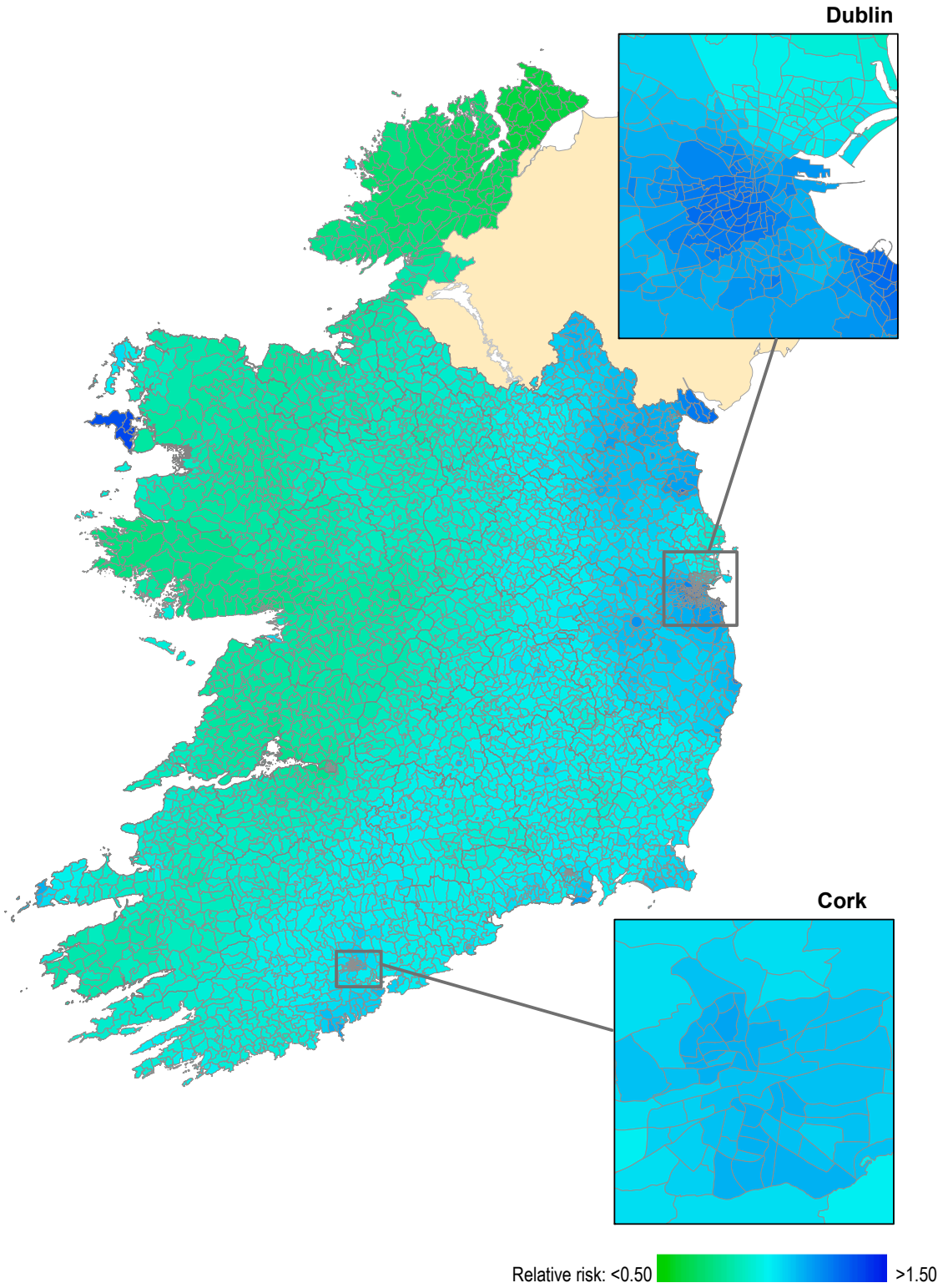
There were few areas with particularly high incidence of oesophageal cancer (maps 13.1-13.3). However, for both sexes the country was clearly split into areas of lower incidence in the northwest of the country (Galway, Clare, Sligo and Donegal counties) and those of slightly higher incidence in the northeast and running toward the south and west. Oesophageal cancer tended to be more common around Cork and Dublin cities for both men and women; for women in counties Kildare and Wicklow; and for men in Louth and Monaghan.

Despite the importance of tobacco and alcohol in the aetiology of oesophageal cancer, there was no clear correspondence between the areas of higher, or lower, disease incidence and those with greater, or lesser, proportions of current smokers or heavy alcohol consumers according to the SLÁN survey (Appendix 1). Nor was there any apparent correlation with areas with a higher frequency of obesity, but this is perhaps not surprising, since the maps above relate to all oesophageal tumours and obesity is only a risk factor for adenocarcinomas. The distribution of poverty (as measured by income) from the SLÁN data was not particularly similar to that for oesophageal cancer.

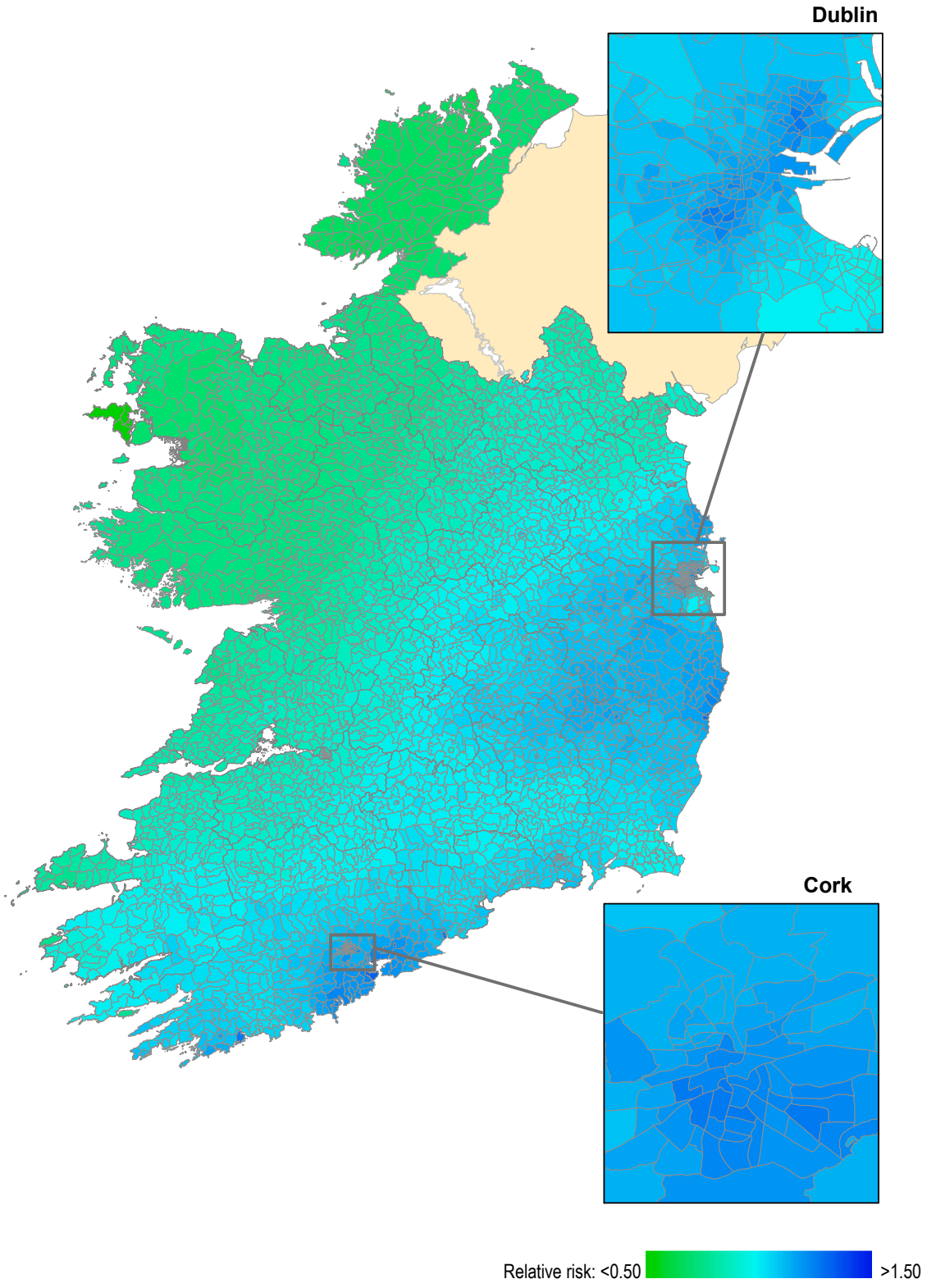
Map 13.1 Oesophageal cancer, smoothed relative risks: both sexes



Map 13.2 Oesophageal cancer, smoothed relative risks: males



Map 13.3 Oesophageal cancer, smoothed relative risks: females



14 Cervix uteri cancer

14.1 Summary

Cancer of the cervix uteri is the ninth most common cancer in women in Ireland, accounting for 2.1% of all malignant neoplasms in women, when non-melanoma skin cancers are excluded (table 14.1). Each year, approximately 183 women are diagnosed with cervical cancer. During 1994-2003, incidence rates remained stable over time.

Table 14.1 Summary information for cervical cancer in Ireland, 1994-2003

% of all new cancer cases	2.0%
% of all new cancer cases excluding non-melanoma skin cancer	2.1%
Average number of new cases per year	183
Average number of deaths per year	73
Age standardised incidence rate per 100,000 (European standard population)	10.3
Estimated annual percentage change in rate 1994-2003	-0.4%

Cancer of the uterine cervix is predominantly a disease of younger women (figure 14.1). Over half are aged under 50 at diagnosis and three-quarters under 60. Of the remainder, 11% are aged 60-69 at diagnosis, 9% aged 70-69 and 4% are 80 and older.

Figure 14.1 Age distribution of cases of cancer of the uterine cervix, 1994-2003